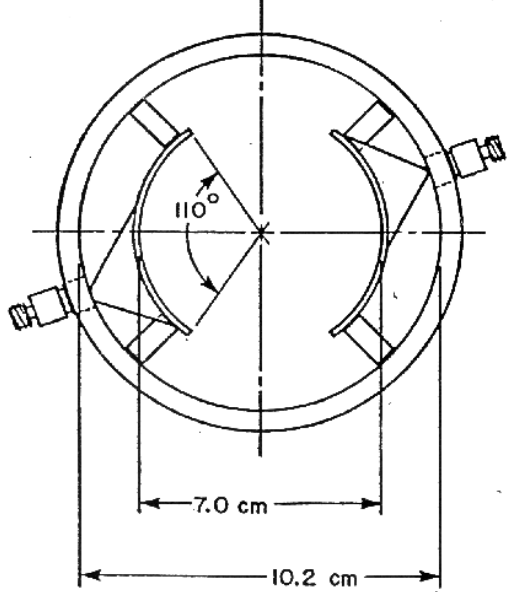


Tevatron BPM Upgrade Commissioning

Stephen Wolbers

Run 2 Meeting

December 15, 2004

Outline

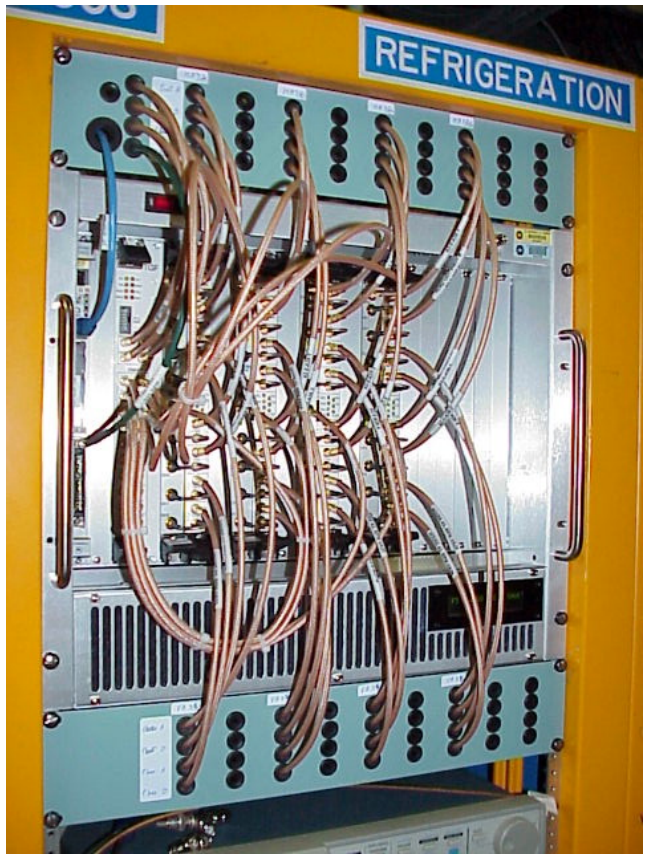
- Hardware delivery status
- Commissioning status in A3
  - Current status
  - Near-term plans
- Plans for the remaining systems
  - Service buildings
  - Software

Hardware Status

- All Echotek boards, analog filters, VME crates, MVME processors, and cables have arrived.
- 5 prototype timing boards and 5 prototype filter boards are available for early commissioning.
  - Final timing boards starting to arrive Dec. 13
  - Final filter boards being assembled Dec. 13
- 2 foot intra-crate cables are being replaced with more flexible cables.
- VME crate monitoring will use a more or less standard Accelerator Division solution (Optilogic).

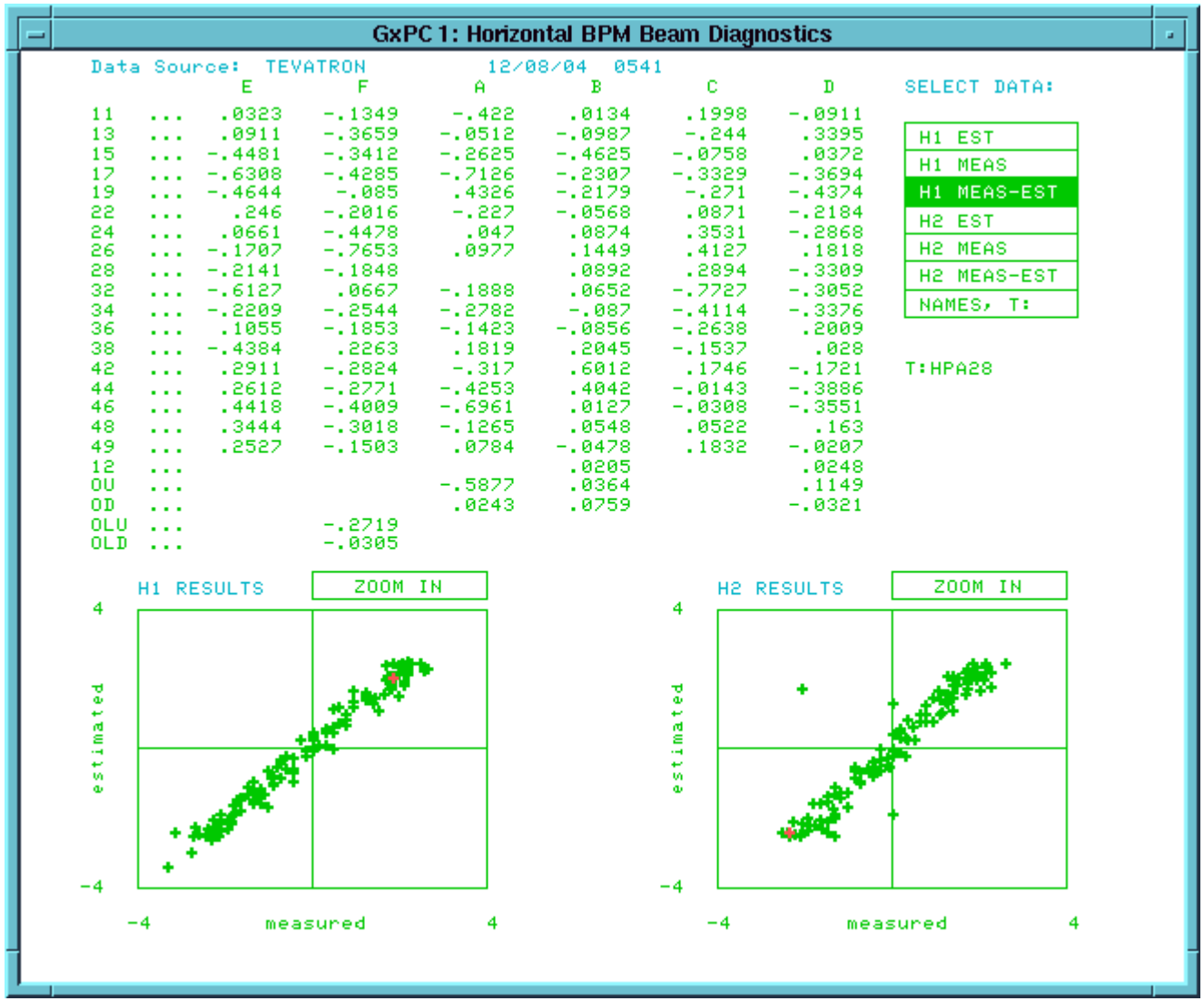
A3 Commissioning

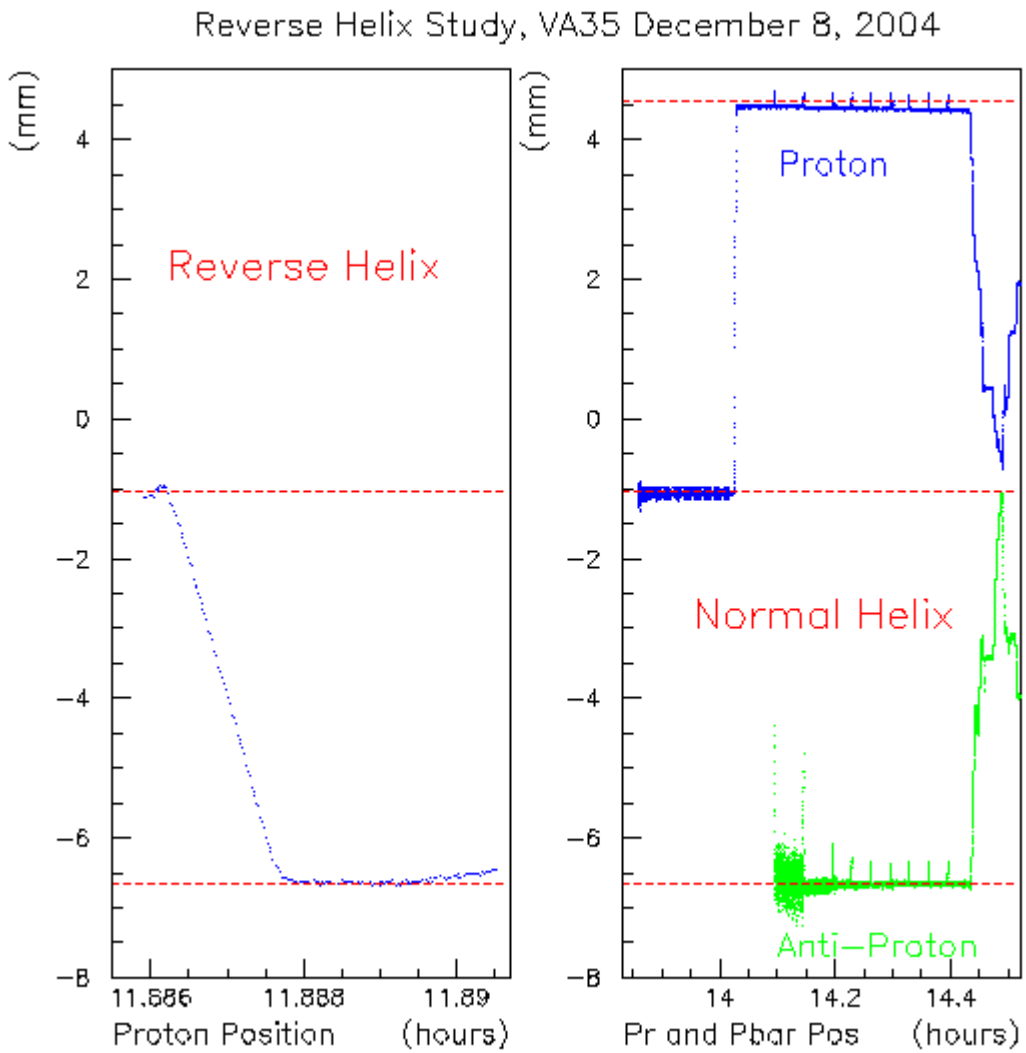
- 8 BPMs instrumented with 4 Echotek boards
- Timing card
- 4 Filter boards with 16 matched pairs of analog filters

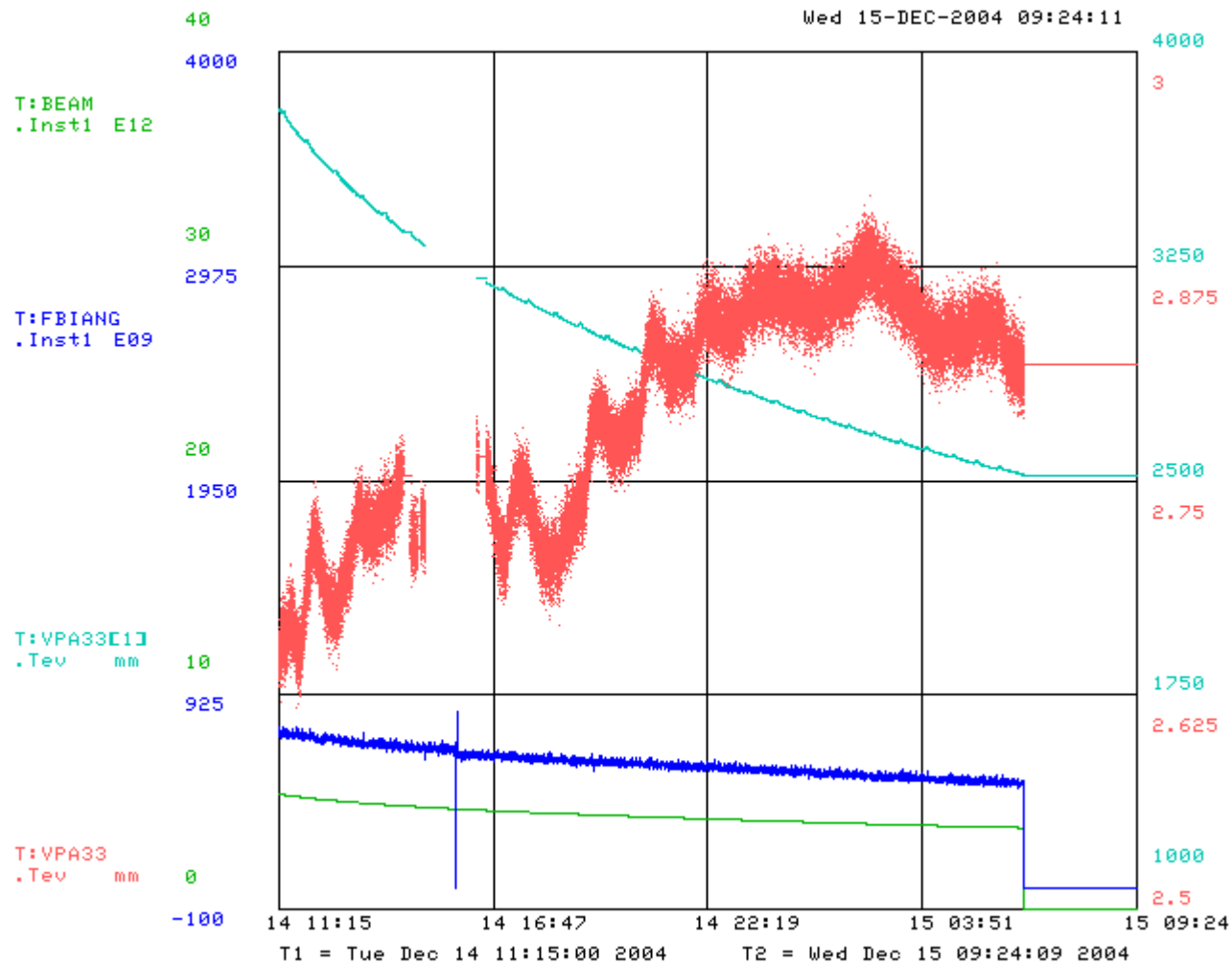


A3 Commissioning Status (From Jim Steimel)

- System returning fairly reliable closed orbit positions for protons.
- Many closed orbit position application programs working relatively seamlessly with the new system.
- Verified reasonably consistent pbar position measurements.


GxPC 1: Horizontal BPM Beam Diagnostics
Data Source: TEVATRON 12/08/04 0541
E F A B C D
11 ... .0323 -.1349 -.422 .0134 .1998 -.0911
13 ... .0911 -.3659 -.0512 -.0987 -.244 .3395
15 ... -.4481 -.3412 -.2625 -.4625 -.0758 .0372
17 ... -.6308 -.4285 -.7126 -.2307 -.3329 -.3694
19 ... -.4644 -.085 .4326 -.2179 -.271 -.4374
22 ... .246 -.2016 -.227 -.0568 .0871 -.2184
24 ... .0661 -.4478 .047 .0874 .3531 -.2868
26 ... -.1707 -.7653 .0977 .1449 .4127 .1818
28 ... -.2141 -.1848 .0892 .2894 -.3309
32 ... -.6127 .0667 -.1888 .0652 -.7727 -.3052
34 ... -.2209 -.2544 -.2782 -.087 -.4114 -.3376
36 ... .1055 -.1853 -.1423 -.0856 -.2638 .2009
38 ... -.4384 .2263 .1819 .2045 -.1537 .028
42 ... .2911 -.2824 -.317 .6012 .1746 -.1721
44 ... .2612 -.2771 -.4253 .4042 -.0143 -.3886
46 ... .4418 -.4009 -.6961 .0127 -.0308 -.3551
48 ... .3444 -.3018 -.1265 .0548 .0522 .163
49 ... .2527 -.1503 .0784 -.0478 .1832 -.0207
12 ... .0205 .0248
OU ... -.5877 .0364 .1149
OD ... .0243 .0759 -.0321
OLU ... -.2719
OLD ... -.0305
SELECT DATA:
H1 EST
H1 MEAS
H1 MEAS-EST
H2 EST
H2 MEAS
H2 MEAS-EST
NAMES, T:
T:HPA28
H1 RESULTS
ZOOM IN
4
estimated
-4
-4
measured
4
H2 RESULTS
ZOOM IN
4
estimated
-4
-4
measured
4


Reverse Helix Study, VA35 December 8, 2004
(mm)
4
2
0
−2
−4
−6
−8
Reverse Helix
11.886
11.888
11.89
Proton Position (hours)
(mm)
Proton
Normal Helix
Anti−Proton
14
14.2
14.4
Pr and Pbar Pos (hours)


Wed 15-DEC-2004 09:24:11
T:BEAM
.Inst1 E12
T:FBIANG
.Inst1 E09
T:VPA33[1]
.Tev mm
T:VPA33
.Tev mm
40
4000
30
2975
20
1950
10
925
0
-100
4000
3
3250
2.875
2500
2.75
1750
2.625
1000
2.5
14 11:15
14 16:47
14 22:19
15 03:51
15 09:24
T1 = Tue Dec 14 11:15:00 2004
T2 = Wed Dec 15 09:24:09 2004

A3 Near Term Plans (Jim Steimel)

- Get profiles working (should be working now but need to be debugged).
- Resolve return from diagnostics application issues.
- Get turn-by-turn data acquisition working.
- Get first turn data acquisition working.
- Get approval from TeV operations to continue commissioning.

Schedule for Service Building Installations

- **Commissioning**
  - Proposal for commissioning order:
    - A3,B3,C3,D3,E3,F2,B0,D0,A2,B2,C2,D2,E2,A4, B4,C4,D4,E4,A1,B1,C1,D1,E1,A0,F3,F4,F1
  - Depends on delivery/successful checkout of the timing and filter boards
  - First timing cards arrived 12/13/04
  - Filter board assembly scheduled to begin 12/13/04. Hope to have boards around Christmas.

Software

- **Software**
  - There is a fair amount of software in and related to the project: front-end, online, calibration, diagnostics, offline, applications.
  - There are many issues left to resolve and some functionality left to complete.
  - This represents a major amount of effort for the project in the coming months.
  - Application code to use the data is being and will be developed primarily by the Tevatron Department physicists.

Summary/Resources

- We continue to move forward thanks to a great deal of effort from many people:
  - About 10 FTE of real work.
  - About 30 people are involved.
- From the latest project file:
  - Total M&S = $1.76M
    - FY05 budget = $125K (timing and filter boards + unexpected expenses)
  - Total Effort = $1.30M (14.1 FTE)
    - This is time-worked only (no vacation or other OPTO, no overheads)